WHAT IS CLAIMED IS:

1. A decoding method of maximum a posteriori probability for calculating backward probabilities from a backward direction to a forward direction with regard to receive data, calculating forward probabilities from a forward direction to a backward direction with regard to the receive data, executing decoding processing based upon the backward probabilities and the forward probabilities, and repeating this decoding processing, said method comprising the steps of:

storing values of forward probabilities and/or backward probabilities, which have been calculated during decoding processing and prevail at calculation starting points, as initial values of forward probabilities and/or backward probabilities in decoding processing to be executed next; and

starting calculation of forward probabilities and/or backward probabilities using the stored initial values in decoding processing executed next.

2. The method according to claim 1, wherein the decoding processing includes the steps of:

dividing encoded data of length N into blocks each of a prescribed length L;

when backward probabilities of a prescribed block are calculated, starting calculation of backward probabilities from a data position backward of this block, obtaining the backward probabilities of this block and storing the backward probabilities;

then calculating forward probabilities and executing decoding processing of each data item in a block of interest using the forward probabilities and the stored backward probabilities; and

thenceforth executing decoding processing of each block in similar fashion.

3. A decoding method of maximum a posteriori probability for dividing data of length N into blocks each of a prescribed length L, calculating backward probabilities from a data position, which is an initial position, backward of a block of interest when backward probabilities of the block of interest are calculated, obtaining and storing the backward probabilities of the block of interest, then calculating forward probabilities, executing decoding processing of each

data item of the block of interest using the forward
probabilities and the stored backward probabilities and
thenceforth executing decoding processing of each block
in regular order, said method comprising the steps of:

5   storing backward probability, which prevails at
the initial position of another block and is obtained
in current decoding processing of each block, as an
initial value of backward probability of the other
block in decoding processing to be executed next; and

10   starting calculation of backward probabilities of
each block using the stored initial value in decoding
processing executed next.

4.   The method according to claim 3, wherein the
initial position is a position that is one block

15 backward of the block of interest.

5.   A decoding method of maximum a posteriori
probability for dividing data of length N into blocks
each of a prescribed length L, calculating backward
probabilities from a data position, which is an initial

20 position, backward of a block of interest when backward
probabilities of the block of interest are calculated,
obtaining and storing the backward probabilities of the
block of interest, then calculating forward
probabilities, executing decoding processing of each

25 data item of the block of interest using the forward
probabilities and the stored backward probabilities and
thenceforth executing decoding processing of each block
in regular order, said method comprising the steps of:
      storing backward probability, which prevails at a

30 starting point of another block and is obtained in
current decoding processing of each block, as an
initial value of backward probability of the other
block in decoding processing to be executed next; and
      in decoding processing of each block executed next,

35 starting calculation of backward probabilities from the
starting point of said block using the stored initial
value.

6.   The method according to claim 5, wherein decoding
by sliding window method is executed only in initial

40 decoding processing of each block.

7.   The method according to claim 5, wherein the
initial position is a position that is one block
backward of the block of interest.

8. The method according to claim 7, wherein a final backward probability β_{jL} of a (j+1)th block is adopted as the initial value of backward probability of a jth block in decoding processing executed next.

5   9. A decoding method of maximum a posteriori probability for calculating backward probabilities from a backward direction to a forward direction with regard to receive data, calculating forward probabilities from a forward direction to a backward direction with regard

10 to the receive data, executing decoding processing based upon the backward probabilities and the forward probabilities, and repeating this decoding processing, said method comprising the steps of:

dividing data of length N into blocks each of a
15 prescribed length L and executing, in parallel simultaneously for all blocks, processing for calculating backward probabilities from a data position, which is a backward-probability initial position, backward of each block, obtaining the backward
20 probabilities of this block and storing this backward probabilities;

when forward probabilities of each block are calculated, executing, in parallel simultaneously for all blocks, processing for calculating forward
25 probabilities from a data position, which is a forward-probability initial position, ahead of this block and obtaining the forward probabilities of this block;

executing decoding processing of data of each block in parallel using the forward probabilities of
30 each block and the stored backward probabilities of each block;

storing a backward probability, which prevails at a backward-probability initial position of another block and is obtained in current decoding processing of
35 each block, as an initial value of backward probability of the other block in decoding processing to be executed next, and storing a forward probability, which prevails at a forward-probability initial position of another block and is obtained in current decoding
40 processing of each block, as an initial value of forward probability of the other block in decoding processing to be executed next; and

starting calculation of backward probabilities and forward probabilities of each block in parallel using the stored initial values in decoding processing executed next.

5   10. The method according to claim 9, wherein the backward-probability initial position is a position one block backward of a block of interest, and the forward-probability initial position is a position one block ahead of a block of interest.

10   11. The method according to claim 10, wherein a final backward probability β_{jL} of a (j+2)th block is adopted as the initial value of backward probability of a jth block in decoding processing executed next; and

a final forward probability α_{jL} of a jth block is
15   adopted as the initial value of forward probability of a (j+2)th block in decoding processing executed next.

    12. A maximum a posteriori probability decoding apparatus for calculating backward probabilities from a backward direction to a forward direction with regard
20   to receive encoding data, calculating forward probabilities from a forward direction to a backward direction with regard to the receive encoding data, executing decoding processing based upon the backward probabilities and the forward probabilities, and
25   repeating this decoding processing, said apparatus comprising:

calculation means for calculating forward probabilities and backward probabilities using encoding data;

30   means for decoding the encoding data using the forward probabilities and backward probabilities; and

means for storing values of forward probabilities and/or backward probabilities, which have been calculated during decoding processing and prevail at
35   calculation starting points, as initial values of forward probabilities and/or backward probabilities in decoding processing to be executed next;

wherein said calculation means starts calculation of forward probabilities and/or backward probabilities
40   using the stored initial values in decoding processing executed next.

13. A maximum a posteriori probability decoding apparatus for dividing encoded data of length N into blocks each of a prescribed length L, calculating backward probabilities from a data position, which is an initial position, backward of a block of interest when backward probabilities of the block of interest are calculated, obtaining and storing the backward probabilities of the block of interest, then calculating forward probabilities, executing decoding processing of each data item of the block of interest using the forward probabilities and the stored backward probabilities and thenceforth executing decoding processing of each block in regular order, said apparatus comprising:

calculation means for calculating forward probabilities and backward probabilities using encoding data;

means for decoding the encoding data using the forward probabilities and backward probabilities; and

means for storing backward probability, which prevails at the initial position of another block and is obtained in current decoding processing of each block, as an initial value of backward probability of the other block in decoding processing to be executed next;

wherein said calculation means starts calculation of backward probabilities of each block using the stored initial value in decoding processing executed next.

14. A maximum a posteriori probability decoding apparatus for dividing encoded data of length N into blocks each of a prescribed length L, calculating backward probabilities from a data position, which is an initial position, backward of a block of interest when backward probabilities of the block of interest are calculated, obtaining and storing the backward probabilities of the block of interest, then calculating forward probabilities, executing decoding processing of each data item of the block of interest using the forward probabilities and the stored backward probabilities and thenceforth executing decoding processing of each block in regular order, said apparatus comprising:

calculation means for calculating forward
probabilities and backward probabilities using encoding
data;

means for decoding the encoding data using the
5   forward probabilities and backward probabilities; and

means for storing a backward probability, which
prevails at a starting point of another block and is
obtained in current decoding processing of each block,
as an initial value of backward probability of the
10   other block in decoding processing to be executed next;

wherein said calculation means starts calculation
of backward probabilities from the starting point of
each block using the stored initial value in decoding
processing of each block executed next.

15   15. A maximum a posteriori probability decoding
apparatus for calculating backward probabilities from a
backward direction to a forward direction with regard
to receive data, calculating forward probabilities from
a forward direction to a backward direction with regard
20   to the receive data, executing decoding processing
based upon the backward probabilities and the forward
probabilities, and repeating this decoding processing,
said apparatus comprising the following for every block
when encoded data of length N has been divided into
25   blocks each of a prescribed length L:

a backward-probability calculation unit for
calculating backward probabilities;

a forward-probability calculation unit for
calculating forward probabilities; and
30   decoding means for decoding the data using the
forward probabilities and backward probabilities;

wherein said backward-probability calculation unit
for each block executes, in parallel simultaneously for
all blocks, processing for calculating backward
35   probabilities from a data position, which is a
backward-probability initial position, backward of each
block, obtaining the backward probabilities of this
block and storing this backward probabilities;

said forward-probability calculation unit for each
40   block executes, in parallel simultaneously for all
blocks, processing for calculating forward
probabilities from a data position, which is a forward-
probability initial position, ahead of this block; and

said decoding means executes decoding processing
of data of each block in simultaneously using the
forward probabilities of each block and the stored
backward probabilities of each block.

5   16.   The apparatus according to claim 15, further
comprising:

first storage means for storing a backward
probability, which prevails at a prescribed position of
another block and is obtained in decoding processing of

10   each block; and

second storage means for storing a forward
probability, which prevails at a prescribed position of
another block and is obtained in decoding processing of
each block;

15   wherein said first storage means stores backward
probability, which prevails at the backward-probability
initial position of another block and is obtained in
current decoding processing of each block, as an
initial value of backward probability of the other

20   block in decoding processing to be executed next;

said second storage means stores forward
probability, which prevails at the forward-probability
initial position of another block and is obtained in
current decoding processing of each block, as an

25   initial value of forward probability of the other block
in decoding processing to be executed next; and

said backward-probability calculation unit and
said forward-probability calculation unit of each block
start calculation of backward probabilities and forward

30   probabilities of each block in parallel using the
stored initial values in decoding processing executed
next.